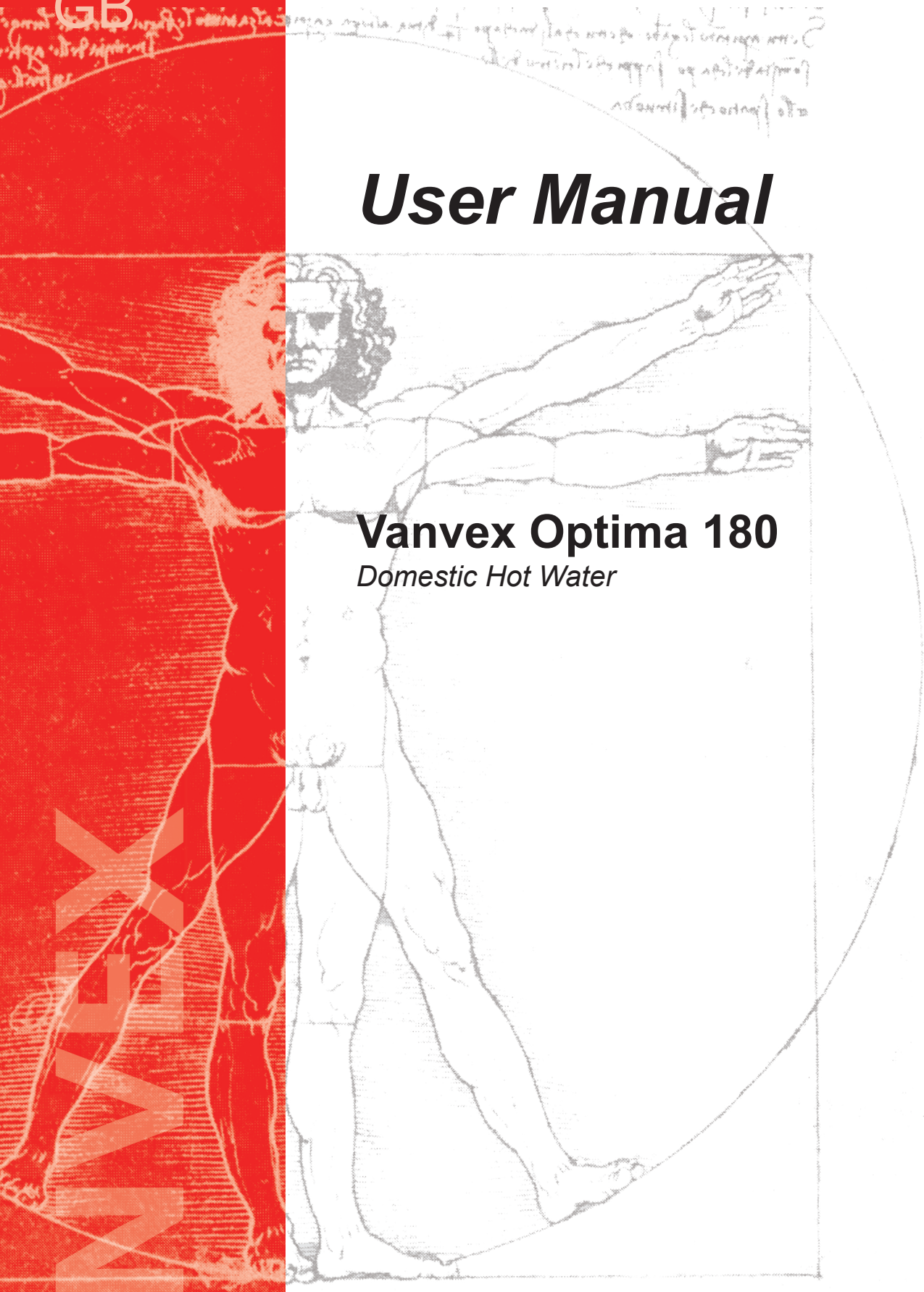
GB

# User Manual



## Vanvex Optima 180

*Domestic Hot Water*

Version 3.07 - 0310

Genvex®

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Subject to Technical Modifications

# 1. Users guide

Optima 180 AC comes with a factory setup, which enables an immediate start of the unit. The factory setup is basic and must be adjusted to the operational requirements and demands of the individual home, in order to obtain the optimum operating benefit from the unit.

## 1.1 Use

### Users menu

The value of a menu item is shown when pressing the key/keycombination below. The value may be changed with the arrows when the key/keycombination is held down simultaneously. The control will return to standard indication if no buttons have been pressed for app. 15 seconds.

**P1: Level**
**The level key is pressed**
With this key, it is possible to switch between: standby, automatic operation, constant operation and timer controlled constant operation. (Level 0, level 1, level 2, level 3).
Level 0: The heat pump is now turned off and the control is active.
Level 1: The fan only runs when domestic water is heated.
Level 2: The fan also runs after the compressor has stopped, providing extract to the home.
Level 3: The fan runs in a chosen period of time - before it switches back to normal operation.

**P2: Electric element ON**
**The electric element key is pressed**
The heat pumps are supplied with an extra heating element for heating the domestic water. With this signal key, it is possible to switch on the electric element for heating the domestic water. By adjusting the set point to 1, the electric element will turn on whenever needed. By adjusting the set point to 0, the electric element will not turn on if needed. At outdoor temperatures below 0°C it is an advantage to use the electric element.
Factory setting: 0

**P3: The operating thermostat is pressed**
The required domestic water temperature may be set between 0 - 55 °C, which is heated by the heat pump.
Factory setting: 52,0°C

**P4: Stop defrosting**
**The level and operating thermostat buttons are pressed simultaneously**
As a standard setting, the defrosting period ends when the temperature has reached 10 °C. During extraordinary operating conditions, it may be necessary to change this temperature. The temperature may be adjusted between 0-25°C.
Factory setting: 10,0°C

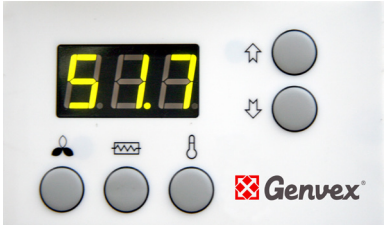
**P5: The electric element**
**The electric element and the operating thermostat keys are pressed simultaneously**
The domestic water temperature may be adjusted between 0 - 65 °C. The electric heating element solely heats the top half of the container, while the heat pump still heats the lower half of the container.
Factory setting: 50,0°C

**Display indication**
It is possible to view various temperatures in the display, by pressing the arrows until the required temperature has been shown. After app. 5 seconds, the temperature is shown. The temperature is shown for app. 30 seconds until the display returns to standard. Following temperatures may be shown:

T4: Extra sensor for free use or forced operating input
T5: Pre cooling surface
T6: Cooling surface
T7: Domestic water top
T8: Domestic water bottom
T9: Solar collector temp (accessory)

## 1.2 Altering of the operation data

Usually, the display shows the water temperature.




Press (arrow up) and (arrow down) simultaneously for app.10 seconds in order to enter the operating menu. The

display will now show the first point E0 in the operating menu. The operating menu will close and return to the main menu if a button has not been pressed for 15 sec.

If you wish to scroll through the operating menu, it may be done by pressing (arrow up) or (arrow down). The value of a point is shown when pressing (temp button). The value may be changed with the (arrow up) or (arrow down) while simultaneously pressing (temp button). The control will return to standard indication if no buttons have been pressed for app. 80 seconds.

## 1.3 Operating menu

**E0: Factory default**
If the system does not function as expected, even though the setpoints have been adjusted, and the cause is impossible to locate, it is recommended to note down the settings in the schedule. Thereafter the setpoint must be adjusted to 1 and wait until the control returns to standard settings. Now all the setpoints have been changed to the factory default. It is now possible to start all over and adjust the set points.
Factory setting: 0

**E2: T9 Set Temp**
If the unit is connected to an under floor heating, this setting controls the desired room temperature where the under floor heating is installed. The temperature is adjustable between 10-30 °C.
Factory setting: 21

**E8: Disinfection function ON/OFF**
By setting the point to 1, the electric heating element will provide 65°C hot water, once a week, in order to disinfect the tank.
Factory setting: 0

**E9: Operating in cold surroundings ON/OFF**
If the setting is 0 the heat pump will run as long as there is a need of heat (= exhaust air-operation).
Using the heat pump when taking the admission air from e.g. the cellar, there is an option of making the compressor stop in case the room is getting to cold. Instead, the electric heater will heat the water. The function is activated when the value has been set to 1 (= circulating air-operation).
It is also possible to automatically let the electrical heater help heating the water when the intake air temperature is below the temperature set in E10. The function is activated when the value has been set to 2 (= fresh air-operation).
Factory setting: 0

**E10: Operating in cold surroundings**
When activating the function menu E9, the temperature at which the compressor will stop, or the heater will assist, may be set. The temperature is adjustable between 0-10 °C.
Factory setting: 5

**E13: Under floor min. Temp**
With this setting the minimum tank temperature is set, which will allow heat to be delivered to the under floor heating circuit. The temperature is adjustable between 20-50 °C.
Factory setting: 35

**E15: Hygrostat / stop unit**
If the value is 0 the speed of the fans will change to 3 when the relative humidity is above the preset value of the hygrostat. If the value is 1 the unit will stop when the clip number 25 and number 26 are short circuiting.
Factory setting: 0

**E16: Min. airflow**
This value shows the minimum speed at which the fan is permitted to run when operating. Notice that the cooling system may be overloaded, resulting a drop out of the high pressure switch, if the value has been set to high. The value should not be chosen higher than necessary, in order to secure a minimal airflow through the cooling surface. Set between 0-100%.
Factory setting: 0

**E17: Extended airflow ON**
At 3rd speed, there is an option of making the unit step down automatically to the 2nd speed, after a number of hours, by adjusting to set 1. If the set point is adjusted to 0, the unit will run at the 3rd speed until a lower speed has been selected manually.
Factory setting: 0

**E18: Hour**
If automatic step-down at 3rd speed is in use, the number of hours at which the unit is to operate with forced air, may be adjusted here. The set point may be adjusted between 1 - 10 hours.
Factory setting: 3

**E19: Solar collector/Under floor heating**
If the setting is 0, a solar collector can be controlled.
If the setting is 1, an under floor heating may be controlled. The set point may be 0 or 1.
Factory setting: 0

**E20: Solar col hyst**
If a solar collector has been connected, a temperature difference may be set, this must be between the water temperature in the solar collector and the operating thermostat of the hot water tank, before the circulation pump of the solar collector is running. The temperature in the hot water tank cannot exceed 70°C with the use of the solar collector.
The set point may be set between 0 - 5°C.
Factory setting: 5

**E21: TX set**
In order to avoid high operating pressures in the cooling system, the system output must be reduced for the remaining part of the heating period. This parameter indicates the water temperature at which the reduction should start. It may be set to 0-55°C.
Factory setting: 45

**E23: Tmop**
This value indicates the maximum permitted evaporation temperature. This prevents overloading of the compressor system at high ambient temperatures.
Adjust this value between 0 - 20°C.
Factory setting: 15

**E25: Vent level 2**
If an extended period of extraction from the building is wanted, it is possible to change to level 2. The fan will now run until another level has been selected, regardless the need of hot water. This option is used to set the speed at which the fan should run, when level 2 is selected. Please note that this setting also sets the maximum fan speed when running in level 1. The speed may be set to 0-100%.
Factory setting: 100

**E26: Vent level 3**
If extraction from the building at a specific length of time is required, it is possible to change to level 3. The fan will now run for the set period regardless the need for heating water. Thereafter the system will return to level 2. This menu option is used to specify the speed at which the fans should run when the set period has been chosen. The speed may be set to 0-100%.
Factory setting: 100%

**E26:**
Available function. Must at all times be 1

**E45: dTair-set**
Here it is possible to choose minimum cooling of the air, while heating the water. The control will adjust the speed of the fan to make sure the air will be cooled at the exact temperature chosen. In case the control, due to technical reasons, needs to cool the air, the value will be controlled by the automatic function. When requiring a larger fan speed, the value may be reduced. Remember though, the fan will run faster, using more energy, if the values are set to low.
Factory setting: 5

## 1.4 Factory default scheme

| Factory defaults: | | Datum | Datum |
|---|---|---|---|
| E0: Factory default 0 | 0 | | |
| E2: T9 set temp 21 | 21 | | |
| E8: Disinfection function ON/OFF | 0 | | |
| E9: Operating in cold surroundings | 0 | | |
| E10: Operating in cold surroundings | 5 | | |
| E13: Under floor min. Temp | 35 | | |
| E15: Hygrostat / stop unit | 0 | | |
| E16: Min. air flow | 0 | | |
| E17: Forced ON | 0 | | |
| E18: hours | 3 | | |
| E19: Solar collector/under floor heating | 0 | | |
| E20: Solar collector hyst | 5 | | |
| E21: TX-set | 45 | | |
| E23: Tmop | 15 | | |
| E25: Vent level 2 | 100 | | |
| E26 Vent level 3 | 100 | | |
| E45 dTair-set | 5 | | |

## 1.5 Defrost program

| T5 before coil °C | T6 in coil °C |
|---|---|
| 15° | -3° |
| 13° | -3° |
| 11° | -3° |
| 9° | -4° |
| 7° | -4° |
| 5° | -5° |
| 4° | -5° |
| 3° | -6° |
| 1° | -7° |
| 0° | -8° |
| -2° | -9° |
| -5° | -11° |
| -7° | -13° |
| -9° | -13° |
| -11° | -15° |
| -13° | -16° |
| -15° | -18° |
| -17° | -20° |
| -18° | -21° |
| -20° | -22° |

# 2. Function

## 2.1 Function description Optima 180

The flow diagram shows the location of the sensors, while the control circuit board shows the relay outputs and the other outputs for connecting fan and control panel.

**Usage of hot tap water heat pump**
The heat pump is only intended to produce hot tap water for domestic use within the specified temperature limits. The Vanvex sanitary hot water heat pump is a complete unit with a 185/285 litre hot water tank, extraction fans, heat pump and also equipped with a complete electrical equipment and five models are equipped with a heating coil which is prepared for connection of a solar collector / central heating.

**Capacity**
The Vanvex is capable of producing a hot water volume of app. 380 Litres at 55°C. The actual volume depends on the supplied fresh water temperature, air temperature and the pattern of use of hot water. The additional electrical heating element may be used to boost the capacity whenever needed. The heat pump only uses app. 30% of the energy compared to a conventional electric boiler.

**Heat pump operation**
The control starts the compressor shortly after hot water has been tapped. The compressor will run until the entire tank has been heated to the set temperature again. Usually the heat pump can produce a sufficient amount of hot tap water covering the needs of a common family.

**Water heating:**
When hot water is drawn off, the tank will be refilled with cold water at the bottom. A sensor measures the temperature at the bottom of the tank and starts the compressor if the temperature has fallen 5°C below the set temperature. The compressor stops, when the water has been heated to the set temperature. While the compressor operates, the fans run and circulate air through the cooling surface.

**Fan operation:**
The fan may be set to run continuously, - even after the compressor has stopped - by selecting level 2 or level 3. This option may be chosen when the Vanvex is used as an extraction system in the residential wet rooms. If the input to T4 short circuits, the control is forced to run at 3rd speed. This may be used in order to achieve more extract in e.g. bathroom, while taking a shower. When breaking the short circuit on the input pins to T4, the control will return to its previous step.

**Defrosting:**
When the temperature difference between the temperature upstream of the cooling surface and the temperature of the cooling surface becomes too large (as happens when ice is formed on the cooling surface), the unit goes into defrost mode. The magnetic valve MA 4 opens and the supply air fan stops until the ice has melted and the cooling surface has reached a temperature of app. 8°C. Then the magnetic valve closes again and the supply air fan resumes operation.

## 2.2 Extra Capacity

If a situation should occur where the heat pump is not capable of producing enough hot tap water, an extra electrical heating element can be switched on. Doing so, it is possible to heat up more water. It is possible to set the desired temperature to which the electrical heater should heat up the water. (Only use the electrical heater when needed, as it uses more energy than the compressor). The activation of the electrical heater is done manually on the display.

## 2.3 Operating safety

**High-pressure switch:**
To prevent the compressor exceeding its range of operation, there is an integral high pressure switch, which interrupts when the pressure becomes too high. Activate the red reset button once the cause of the error has been identified. When the high pressure switch interrupts, the red Genvex logo will flash until the red reset button on the pressure switch is activated. In order to prevent a repetition of a pressure switch error, the water may be set 2-3 °C lower.

**Safety breaker for electrical heating element**
If an error occurs at the heater, the safety breaker trips and stops the heater in order to prevent the tank from being overheated. Resetting the safety breaker may be done by breaking the small knob in the centre.

(**When working on the heat pump, always make sure the power supply is disconnected.**
**Any work on this unit may only be carried out by trained personnel!)**

## 2.4 Warnings

**High-pressure switch:**
When the pressure switch trips, the red light on the display will light until the pressure switch is reset.

# 3. Maintaining

The following instructions must be followed in order to ensure optimum operation of the Vanvex:

**The power supply to the system must always be switched off before opening the Vanvex's cover.**

When the unit has been installed for the first time make sure the water connections are checked after a few days to make sure there are no leaks. Also check that the condensate drain pipe is not blocked.

**Environmental considerations**
When the unit is being serviced or its operation is cancelled, please make sure to follow the guidelines for recovery and disposal of all materials according to local procedures and laws.

## 3.1 Communication box

To allow Optima 180 to communicate with the computer (data logger), CTS unit, the "Genvex Datalogger" communication box must be mounted between the control panel and the computer/CTS unit. The unit is sold by Genvex.

## 3.2 Cooling system

**Fan**
Maintaining the fans is mainly periodicly cleaning of the evaporator. Disconnect the flexible hoses from the top of the unit and unscrew the top plate. Clean the fan with a suitable brush. Do not remove the balancing blocks from the impeller, as this will cause imbalance and with it more noise and fan wear.

**Risk of injury from sharp-edged fins! DO NOT damage this fins!**

**Condensate drain:**
When changing the filters in the autumn season check the condensate drain and tray for blockage by dirt. Fill water in the condensate tray and check that the water runs out unhindered. Should this not be the case the drain must be cleaned. At the same time make sure that the plates of the evaporators are clean.

## 3.3 Watercircuit and tank

**Safety valve:**
The installer have fitted a safety valve on the cold water supply pipe for the hot water tank. This valve is a protection of the tank against excess pressure when the domestic water expands during heating. The non-return valve, which is fitted before the safety valve on the cold water pipe, prevents the water from flowing back into the cold water pipe. This means that the pressure in the tank will increase to the maximum pressure permitted by the safety valve, at which point it will open and allow the surplus water to escape. If the safety valve did not open, the tank would burst.
To make sure that the safety valve is working properly, it should be inspected several times a year. To do this, press the spring-loaded arm on the safety valve and see if water comes out of the valve. Damage caused by a blocked safety valve is not covered by the Genvex warranty.

**Anode:**
In order to prevent corrosion of the enamelled hot water tank, the tank is fitted with a magnesium anode with a ¾" screw plug. This anode has a life expectancy of 2-5 years. It is nevertheless important to check that the anode is intact at all times. This should be done by inspecting the anode every 2 years and replacing it if it is corroded and measures only 6-10 mm in diameter. To inspect the anode, turn off the power supply to the system and remove the front cover. The hot water tank has to be drained before the anode can be unscrewed. To do this, turn off the cold water supply , attach a hose to the drain valve to ensure the water runs to the nearest drain. When draining the water from the tank, turn on a hot water tap to prevent negative pressure in the tank. When the tank is empty, the anode can be unscrewed and inspected. When the anode has been fitted again, close the drain cock and turn the valve water supply back on to fill the tank with water. When the tank is full and the cover back on, the power supply can be switched on again.

## 3.4 Demounting

The following actions must be taken:
Disconnect the power supply to the unit and disconnect other connections. Shutoff the fresh water supply valve and connect a drain hose to the drain valve in order to drain the water. While draining, a hot tap water valve should be opened to avoid under pressure in the tank. The air duct connections are uninstalled and remaining air channels must be closed to avoid condense water entrance to the building.

# 4. Fault finding

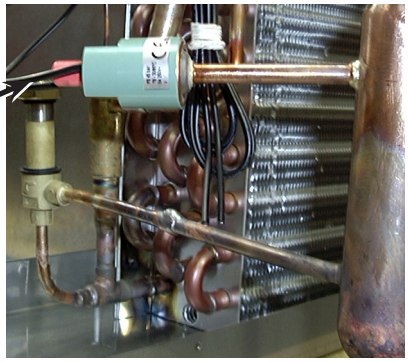
The heat pump is equipped with the following safety devices:

## 4.1 High pressure switch:

To prevent the compressor exceeding its range of application, there is an integral high pressure switch, which interrupts when the pressure becomes too high. In case of interruptions (too high pressure) the red light in the control panel will flash and the high pressure switch will stop the heat pump. The red light lights. Restart the equipment by manually resetting the high pressure switch.

For manually resetting the high pressure switch. The front door can be removed by releasing the screws.

**For RESET press the red button.**



## 4.2 Safety breaker for electrical water heater

The safety breaker protects the equipment against overheating during heating with the electrical heating element. The safety breaker is mounted on the heater. If the adjusted value (90°) is exceeded the heating coil will disconnect. It can be reconnected when the temperature is below 90°. To do this, the power to the equipment must be off, front door dismantled and the front cover of the heating element dismantled. The reset button can now be pressed.
Please notice: Be careful not to damage or tear the cables to the control.

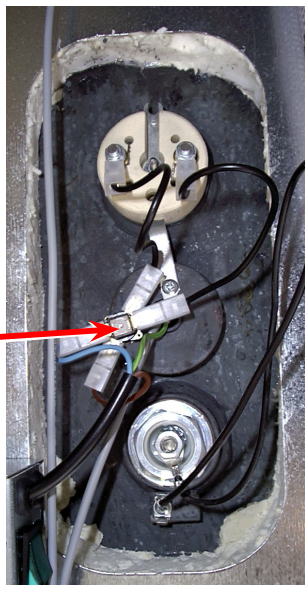
## 4.3 The heat pump will not run!

Please test if:

- power is connected?
- power is turned on at the wall plug?
- the water temperature is at set point?
- the temperature of the domestic water > 55° C
- the cable between controller and display is connected?

If this does not help locating the error, please contact your local installer or service contractor.

**For RESET press the small white pin in the centre.**



**Notes:**

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## Intelligent ventilation systems from Genvex A/S

As ventilation specialists, we offer a product range that covers all aspects of modern ventilation equipment, from passive ventilation units with highly effective counter current heat exchangers to units with integrated heat pumps that are extremely energy-efficient for heating and cooling.

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